Choices for Stewardship: Recommendations to Meet the Transportation Future

Commission on the Future of Transportation in the Commonwealth

Joint MassDOT/FMCB

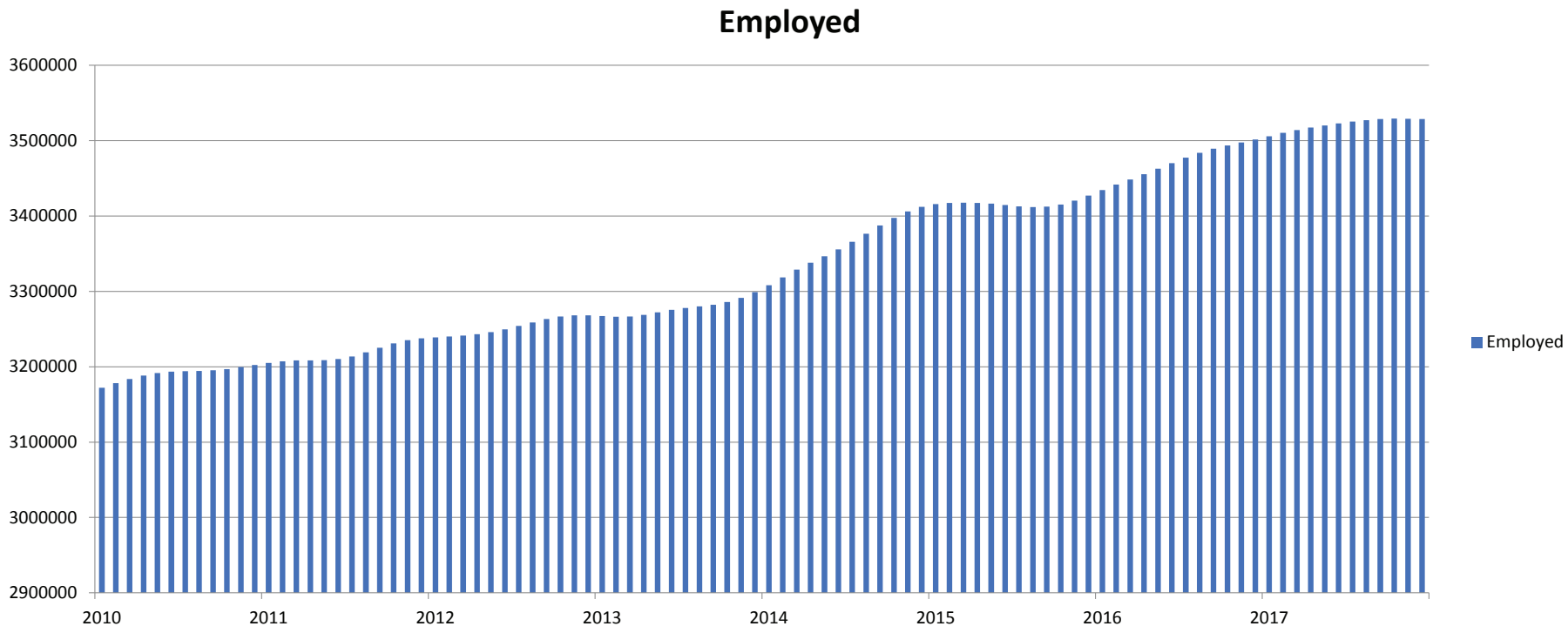
December 2018

How the report is organized

- Volume I: Choices for Stewardship: Recommendations to Meet the Transportation Future
  - Section 1: Facts, Trends, & Issues
  - Section 2: Scenario Planning
  - Section 3: Commission Recommendations

- Volume II: Background Books – Facts, Trends, & Issues
  - Demographics and Land Use
  - Transit, Active Transportation, and Mobility Services
  - Autonomous and Connected Vehicles
  - Climate Change and Resilience
  - Transportation Electrification

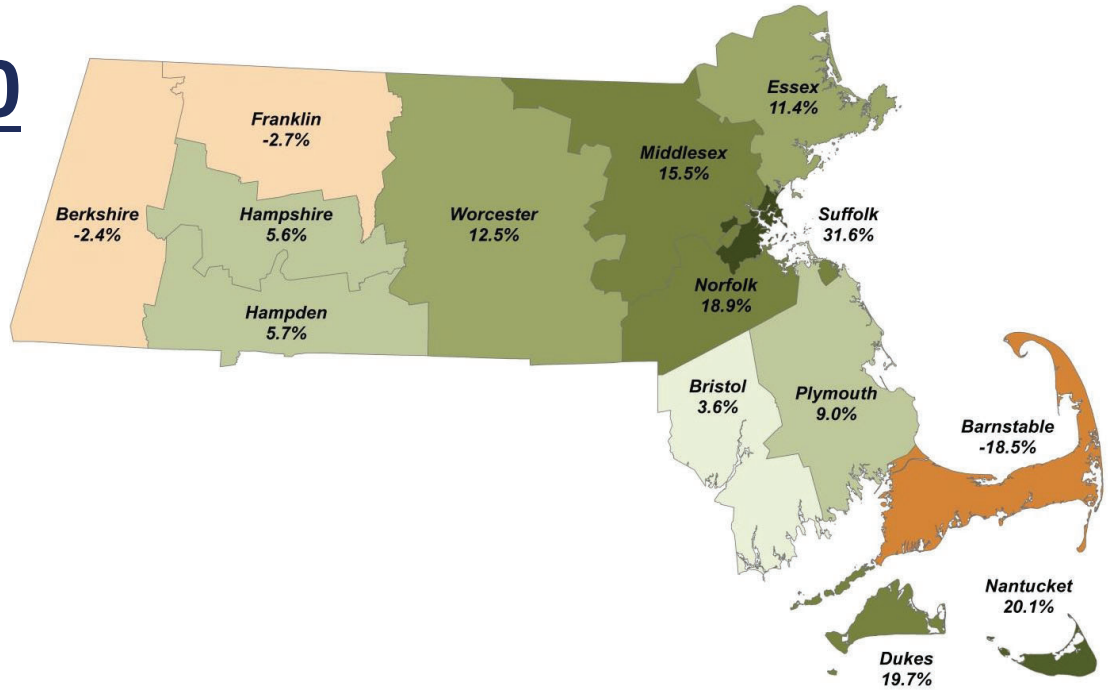
Over 356,000 Newly Employed (2010-2017)



By 2040: MA Population is Projected to Grow by ~600,000

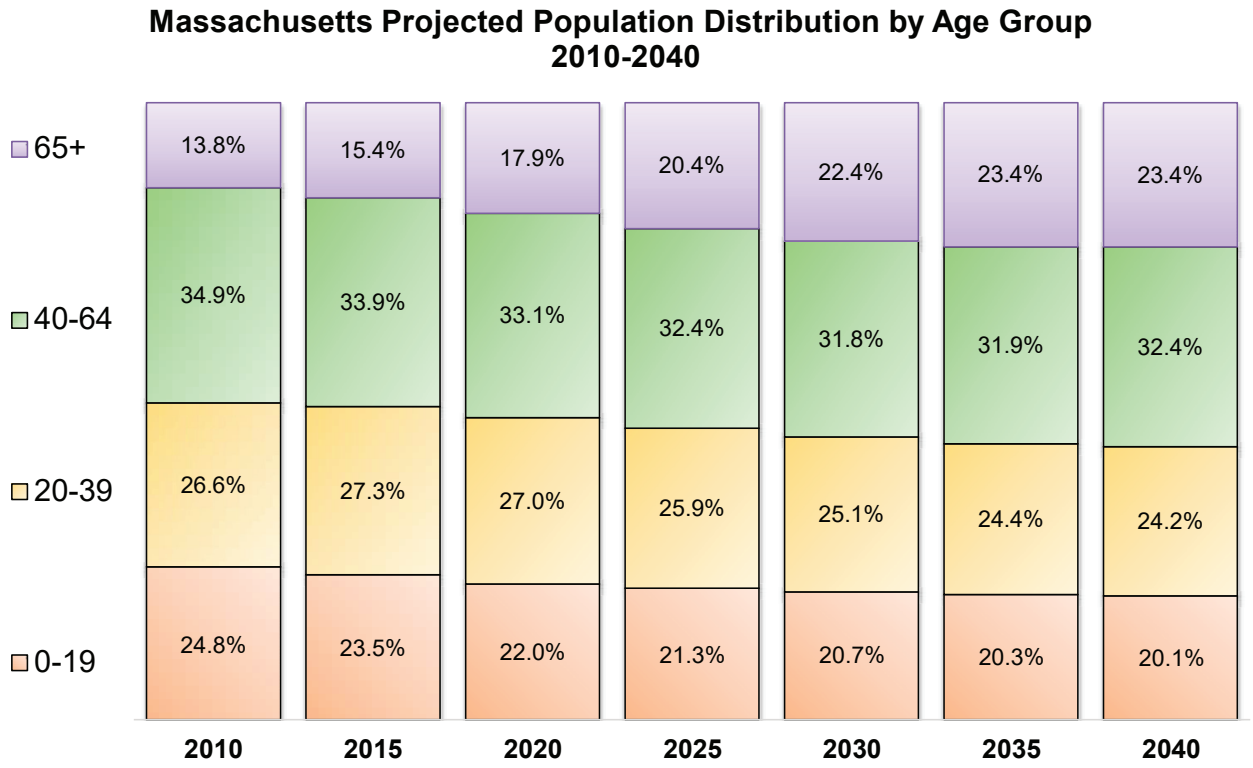
Anticipated Percent Change in Population by County

2010-2040



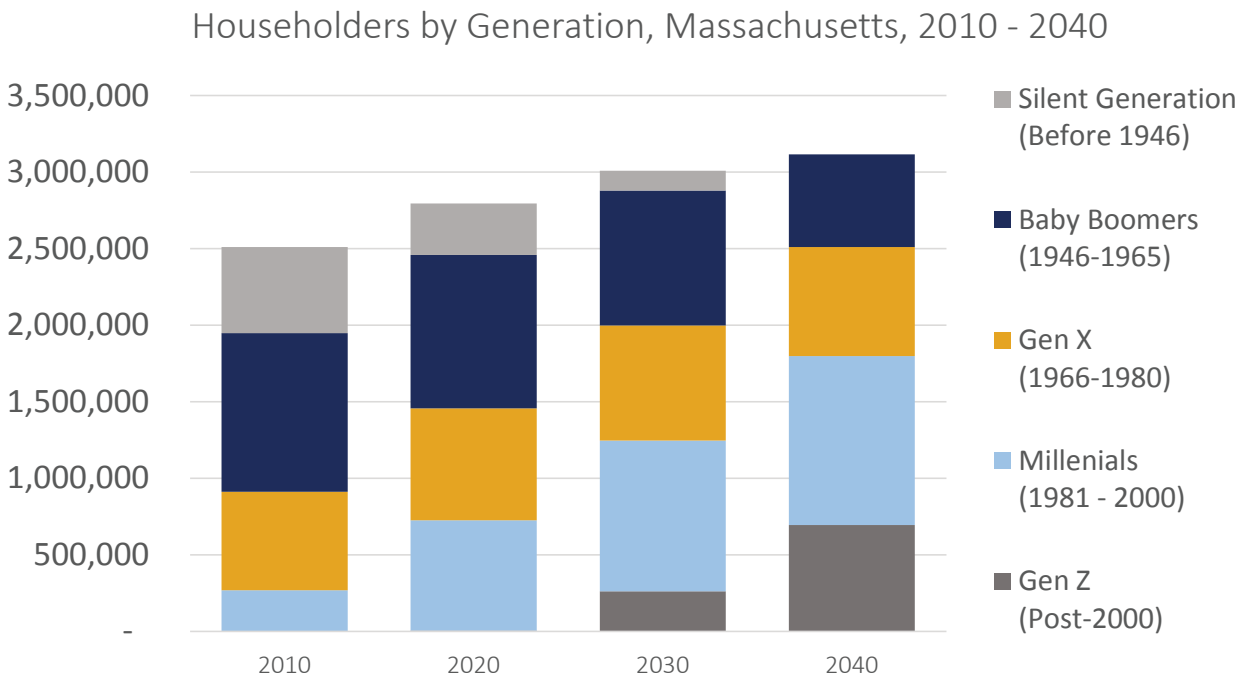
Source data:

65+ Nearly Doubles as Share of Population



Source Data: U.S. Census Bureau, 2010 Census Summary File 1; UMass Donahue Institute Population Projections2018

By 2040, most households will be headed by someone born after 1980



Source data: MAPC Household Projections & UMDI/MassDOT Population Projections

AV Technology: 5 Levels of Automation

Level 4&5: No Human Drivers. When? Widely Varies

"a fully-featured Google self-driving car might be 30 years away." Chris Urmson SXSW 2016

Level 4 AV technology could be **19-75%** of vehicles by 2040.

Bansal and Kickelman "Forecasting American's Long-term adoption of connected and autonomous vehicles technologies", Transportation Research part A. 2017

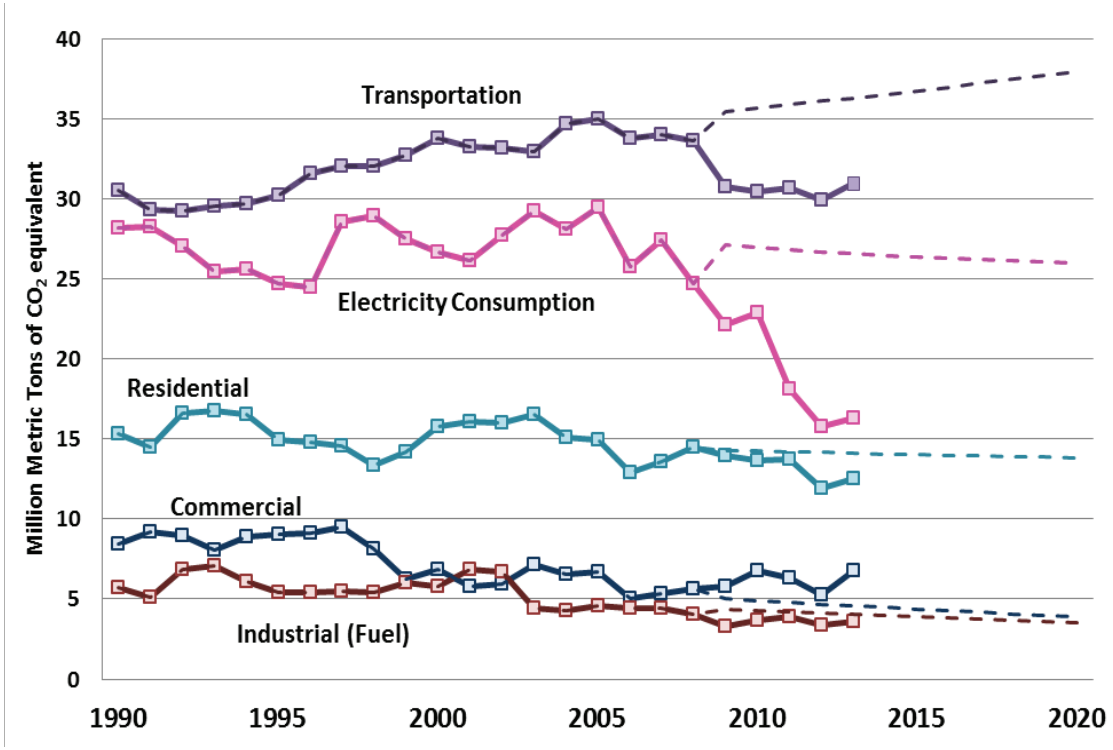
Facts/Trends/Developments:

- Cost and willingness to pay are the major economic forces behind technology adoption
- Full level 5 automation is more than 10 years away

Impacts

- Level 4 automation is an important consideration, where when and how might these vehicles be bounded

Transportation Has Largest Share of CO2 Emissions



Chinese are electrifying bus fleet

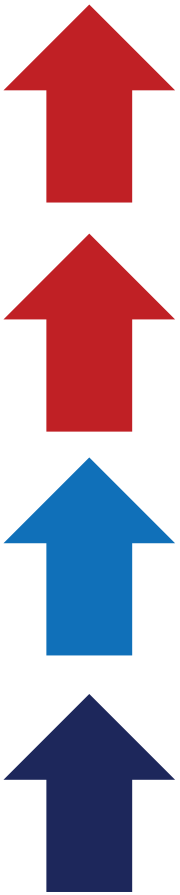
China's Shenzhen city electrifies all 16,359 of its public buses

The city has transformed the entire bus fleet.

Daniel Cooper, @danielwcooper
12.29.17 in Green

32 Comments
6405 Shares

Massachusetts Climate Changes Projected by the 2090s



Temperature

7.2°F

Average Annual;
Range: 4 to 11 °F

90°F Days

34

Annual;
Range: 11 to 64 days

Sea Level Rise

4 to 10.2 feet

Relative to mean sea level in 2000

2" Precipitation Days

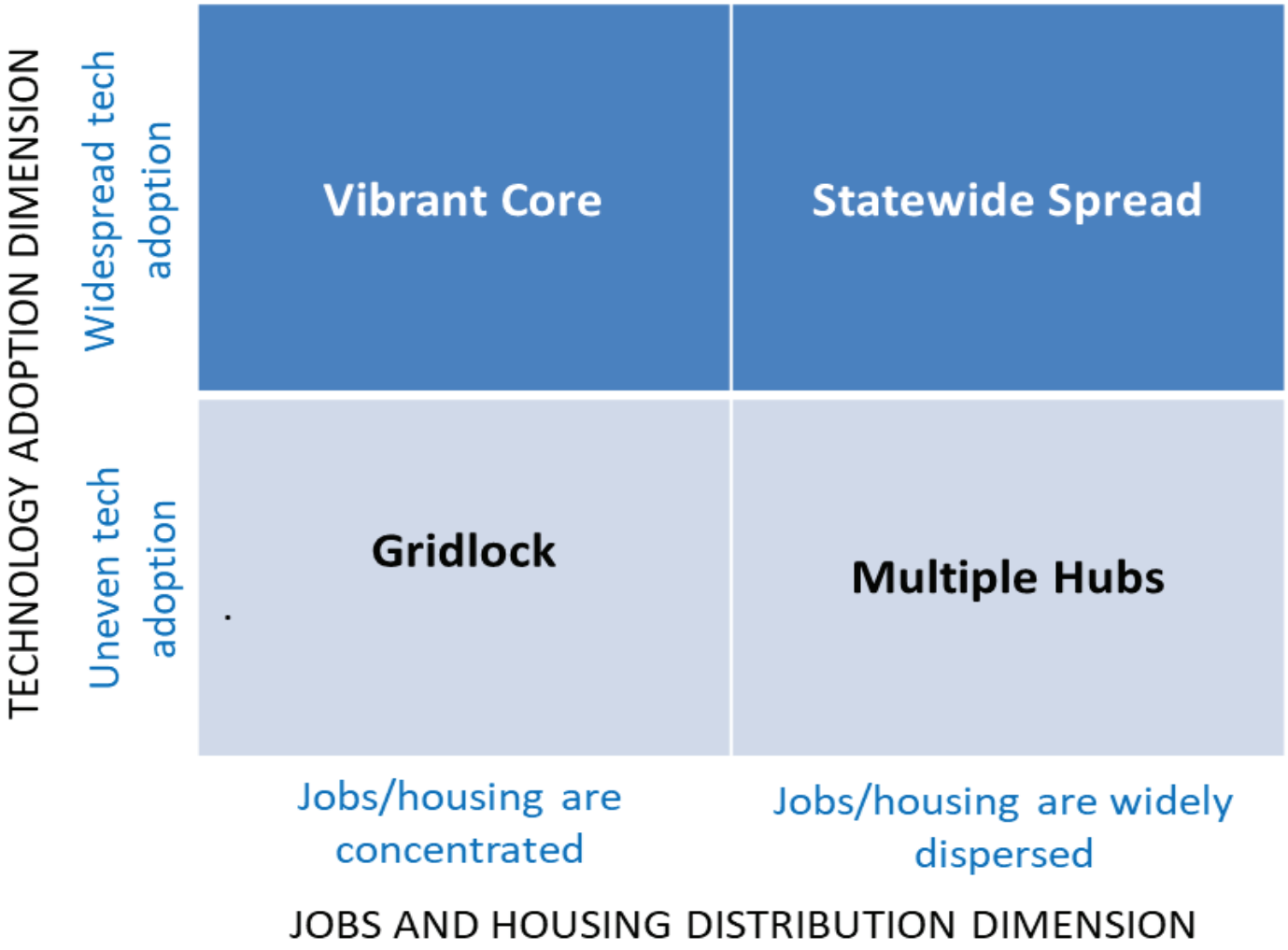
47%

Annual

Source: Northeast Climate Adaptation Science Center

Boston
6 feet of
Sea Level Rise
Image and data courtesy NOAA
Sea Level Rise Viewer
Broad Sound
Cemetery
Everett
Middlesex
Suffolk
Revere
Reservation
Mystic River
Assembly
Row
Chelsea
Chelsea River
Suffolk
Downs
Belle Isle
Marsh
Reservation
Winthrop
Charles River
Suffolk
Boston
Boston Harbor
Deer Island
Deer
Island
Boston Harbor

Plausible Scenarios for 2040


TECHNOLOGY ADOPTION DIMENSION
Widespread tech adoption
Uneven tech adoption
Vibrant Core
Statewide Spread
Gridlock
Multiple Hubs
Jobs/housing are concentrated
Jobs/housing are widely dispersed
JOBS AND HOUSING DISTRIBUTION DIMENSION

Commission Recommendations

5 Major Categories; 18 Total Recommendations

1. Modernize existing transit and transportation assets to more effectively and sustainably move more people
2. Create a 21st century “mobility infrastructure” to capitalize on emerging changes in transportation technology and behavior
3. Substantially reduce GHG (greenhouse gas emissions) from the transportation sector
4. Coordinate and modernize land use, economic development, housing, and transportation policies and investment
5. Make changes to current transportation governance and financial structures

Recommendation #1: Prioritize investment in public transit as the foundation for a robust, reliable, clean, and efficient transportation system.

- The Commission elected to lead with this first, foundational recommendation because high-frequency, high-capacity public transit is the most efficient and sustainable way to move large numbers of people.
- This is true today and will be true in 2040 even in the scenario that the transportation system is be dominated by fleets of electrified autonomous vehicles.

Recommendation #2. State and municipal roadway design and operation should prioritize person throughput, rather than vehicle throughput, so that corridor capacity is allocated to moving as many people as possible.

- Transportation agencies too often prioritize the movement of vehicles over the mobility of the people. Going forward, roadway owners must prioritize the movement of the maximum number of people, regardless of mode, in the design of transportation projects both for new facilities and the retrofitting of existing corridors in order to accommodate additional modes.

Recommendation #3. Work with multiple stakeholders to better manage today's traffic congestion – and the congestion challenges of the future.

- Congestion has grown to a nearly intolerable level in the Boston metro region and is increasingly an issue in other urban areas. With the anticipated growth in population and jobs, it is likely that congestion will only get worse without action.
- But there is no silver bullet – congestion is a product of many factors, and there is no single solution that will alleviate it.

Recommendation #5. Support and accelerate efforts to consume transportation differently.

- MassDOT should lead the development of policies related to changes in mobility practices, including ride-sharing, vehicle-sharing, Mobility as a Service (MaaS), on-demand mobility (ODM), and micro-mobility.
- MassDOT should explore policies that support multi-passenger trips, encourage public transit agencies and other service providers to experiment with MaaS platforms, and work with municipalities in areas where access to new mobility services and technologies are limited.

Recommendation #7. The Commonwealth should facilitate a statewide electric charging infrastructure, and/or the infrastructure needed for other alternative fuels that is fast, equitable, robust, and resilient in order to support an increasing fleet of zero emission vehicles.

- To meet Global Warming Solution Act goals, all types of vehicle owners, including residents, businesses, non-profits and government agencies of all sizes to significantly reduce reliance on fossil fuels.
- However, only through a robust charging network will consumers have the necessary confidence in reliability for wide-scale EV adoption.

Recommendation #9. Establish a goal that beginning in 2040, all new cars, light duty trucks, and buses sold in Massachusetts will be electric or another technology that meets same emissions standards.

- Achieving the GWSA mandate will require the near-complete transition of our vehicle fleet (cars, trucks, and buses) to electric vehicles or other zero-emission vehicle technology.
- Because vehicle fleets turn over slowly, for vehicles on the road to be electric by 2050, we will need all vehicle sales to be electric by no later than 2040.

Recommendation #11. Make all current and future critical state and municipal transportation infrastructure resilient to a changing climate.

- The urgency of climate impacts is such that MassDOT and other state and municipal transportation agencies need to make resilience an area of focus for capital planning and construction, and must do so in two ways: (1) prioritize the necessary retrofit and adaptation of critical infrastructure in a responsibly incremental way, and (2) make resiliency a key design feature – on par with safety and mobility – in the engineering and construction of all projects.
- MassDOT should develop and disseminate resiliency-oriented statewide design standards for transportation infrastructure, including infrastructure owned by the MBTA and the RTAs; by 2020, no project should be built that does not conform to those standards.

Recommendation #15. Coordinate the planned reinvention of the MBTA commuter rail system with local, regional, and state land use and economic development strategies to maximize the ridership and economic benefits of the reinvented system.

- The goal of this exercise is to re-orient the commuter rail from its current configuration as a commuter train taking passengers to and from Boston to a regional train system that connects hubs and serves the region all day, every day.

Recommendation #17. Prepare MassDOT and other transportation-related entities to effectively oversee a changing transportation system.

Our specific recommendations include:

- A dedicated MBTA Board
- Explicit coordination around housing, economic development, environment, and transportation
- A new paradigm for MassDOT, MBTA, and RTAs
- Data-sharing that protects privacy while enabling improved services, traffic operations, and integrated mobility options

Recommendation #18: Develop a fiscally sound and responsible transportation resource plan to operate, maintain, and upgrade the transportation system.

- Among the most significant contributions that today's decision makers could make to the public for the year 2040 is to commit to providing sufficient resources for the proper maintenance, operation, and upgrades to the state's transportation network.

- The Commission concludes its report with this recommendation, not because it is the least important, but, rather, because the promise found in our earlier recommendations can only be achieved through a long-term commitment to providing the resources necessary to operate and maintain the Commonwealth’s evolving transportation system.